

have among us those who readily believe in the old and the new errors that start up from time to time and with the help of the daily newspapers preserve a wandering existence like the will-o'-the-wisp.

My old village oracle told me many stories about a man she had known, who used to go about the country with a small black bag in which were a little book, a little stick, and a bunch of herbs. Whenever a storm was brewing he was to be seen standing on some rising piece of ground, and repeating his formulas against the gathering clouds. "People used to abuse him," she said, "and to say that he was in league with the devil; but I never saw him do any harm, and now that he is dead there are many who regret him, for since then we have had heavier hailstorms than ever were known in his time."

Instances of weather makers are also common in Germany. We are told that there used to live in Suabia long ago a pastor renowned for his proficiency in exorcising the weather, and whenever a thunderstorm came on he would stand at the open window invoking the clouds till they had all dispersed. But the work was heavy and difficult to do, and the pastor used frequently to be so exhausted after dispersing a storm that large drops of perspiration would trickle down his face.

We are also told that many years ago, in the village of Wermesch, there lived a peasant who, whenever a thunderstorm was seen approaching, used to take his stand in front of it armed with an axe, by which means he always turned the storm aside. One day, when an unusually heavy storm was seen approaching, the weather maker, as usual, placed himself in front of it, and hurled the axe up into the

clouds. The storm passed by, the axe did not fall down to the earth again. Many years later, the same peasant taking a journey farther into the land, entered the hut of a Wallachian, and there, to his astonishment, found the axe he had thrown into the thunderclouds several years previously. This Wallachian was a still greater sorcerer in weather making than the Wermesch peasant, and had therefore succeeded in getting the axe down again from the sky.

There are many old formulas and incantations bearing on this subject to be found in ancient chronicles, of which the following one bears a date of the sixteenth century:

Formula.—And the Lord went forth down a long and ancient road, and there was met by an exceeding large, black cloud; and the Lord spoke thus to it: "Where goest thou, thou large, black cloud? Where goest thou go?" Then spoke the cloud, "I am sent to do an injury to the poor men, to wash away the roots of his vines, and to overthrow the grapes." But the Lord spoke, "Turn back, turn back, thou big black cloud, and do not wander forth to do an injury to the poor man, but go to the wild forest and wash away the roots of the big oak tree and overthrow its leaves. Saint Peter, do thou draw thy sharp sword and cut in twain the big black cloud, that it may not go forth to do an injury to the poor men."

Underneath this incantation the writer has put the following memorandum: "Probatum an sit me latet probet quicunque vult."

In many houses it is still customary to burn juniper berries during a thunderstorm, or to stick a knife in the ground before the house. Like the Roumanian, the Saxon also considers it unsafe to point at an approaching thunderstorm; but this is a belief shared by many people, I understand.

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Chief of Division of Meteorological Records.

The month for the most part was warm and dry. Low temperatures prevailed east of the Rocky Mountains from the 1st to the 5th, but from that date until the 25th a number of lows, first appearing on the weather map over the North Pacific coast and the Southwest, respectively, moved across the country in rapid succession, giving abnormally warm weather in almost all districts. From the 25th until the end of the month several moderate cold waves moved southeastward from Assiniboia carrying the line of freezing temperature to the east Gulf coast and northern Florida on the 30th of the month.

The minimum temperatures of the month were generally recorded from the 1st to the 3d and from the 26th to the 31st. No very severe cold waves occurred.

The rainfall on the California coast was light and scattered after the 8th, and the month as a whole gave less than the normal amount.

The snowfall was light in all districts and quickly disappeared. Less than an inch fell during the entire month over probably two-thirds of the total area of the United States. At the end of the month there was no snow upon the ground east of the Rocky Mountains, except in the Ohio Valley, the Lake region, New England, and a portion of the Middle States.

PRESSURE.

The distribution of monthly mean pressure is graphically shown on Chart IV, and the numerical values are given in Tables I and II.

In connection with the pressure distribution for the current month it is to be noticed that a ridge of high pressure extends from eastern Tennessee to eastern Oregon and Washington. This type of pressure distribution is generally contemporary with dry weather east of the Rocky Mountains. As compared with the preceding month, pressure fell in the majority of districts.

TEMPERATURE OF THE AIR.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	10	35.8	+ 2.1	.....	.....
Middle Atlantic	12	34.7	+ 2.2	.....	.....
South Atlantic	10	46.3	— 0.2	.....	.....
Florida Peninsula	7	57.9	— 2.2	.....	.....
East Gulf	7	48.8	— 1.0	.....	.....
West Gulf	7	50.0	+ 3.4	.....	.....
Ohio Valley and Tennessee	12	37.1	+ 2.8	.....	.....
Lower Lake	8	28.6	+ 3.2	.....	.....
Upper Lake	9	24.2	+ 6.6	.....	.....
North Dakota	7	17.0	+14.6	.....	.....
Upper Mississippi Valley	11	20.2	+ 8.2	.....	.....
Missouri Valley	10	30.3	+10.1	.....	.....
Northern Slope	7	30.2	+13.5	.....	.....
Middle Slope	6	36.8	+ 8.8	.....	.....
Southern Slope	6	43.3	+ 6.4	.....	.....
Southern Plateau	13	42.8	+ 6.7	.....	.....
Middle Plateau	9	31.6	+ 8.1	.....	.....
Northern Plateau	10	34.5	+10.0	.....	.....
North Pacific	9	43.1	+ 4.5	.....	.....
Middle Pacific	5	49.8	+ 2.7	.....	.....
South Pacific	4	54.6	+ 4.0	.....	.....

Temperature was markedly above normal in all districts save the South Atlantic States and Florida. The average excess ranged from about 15° daily in Montana and North Dakota to less than 1° in southeastern Tennessee and about 3° on the Pacific coast. The monthly means ranged from about 12° in northern Minnesota to 50° and over in southern

Texas and Florida. The maximum temperatures ranged from about 45° in the coldest regions to about 80° in the warmest, and the range in the minimum temperatures was even greater, viz, from 30° below zero in the Lake Superior region to 29° above on the Texas coast.

In Canada.—Prof. R. F. Stupart says:

The temperature was above average throughout the Dominion, and to a considerable amount in nearly all localities. In southern Alberta the large excess of 19° was recorded, and the smallest amount, 2° above average, occurred along the shores of Lake Erie.

PRECIPITATION.

Less than the normal amount of rain and snow fell in practically all districts, the only exception being a portion of New England and the Florida Peninsula. The district averages and departures are given in the table below.

Snowfall was also deficient in almost all districts. Over the western half of the Lower Peninsula of Michigan, and generally over the upper peninsula, nearly the average amount of snow fell, and there was a considerable fall of snow in the Adirondacks, and locally in the lower Lake region, Vermont, and New Hampshire.

The Climate and Crop Services of the Rocky Mountain region generally report less snow than usual.

The total depth of snow for the month, and the amount on the ground at the end of the month are shown by Charts No. VIII and IX, respectively, and the numerical values appear in Table II.

In Canada.—Professor Stupart says:

The precipitation was above average to a considerable amount in the Maritime Provinces, except in portions of Prince Edward Island, where the average was not reached. Elsewhere throughout the Dominion, except locally, the precipitation was below the average, the greatest discrepancy occurring in British Columbia. The local exceptions were Montreal, nearly 2 inches above the average, Parry Sound, 0.5 inch above, Minnedosa, Battleford, and Edmonton, 0.2 inches above. The precipitation over the greater part of Canada was largely rain, until the latter part of the month, when it was chiefly snow, especially in Ontario and Quebec. On the last day of the month snow covered the Province of Quebec to a depth of from 13 to 30 inches. In northern New Brunswick there was from 10 to 20 inches, and in northern Ontario, and along the north shores of Lake Superior to the Lake of the Woods, from 10 to 24 inches. In southern Ontario, and also in Manitoba and the Territories, there was only a light covering for the most part, and in the southern part of the Maritime Provinces and the Territories, and also over the greater portion of British Columbia, there was none.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		<i>Inches.</i>		<i>Inches.</i>	<i>Inches.</i>
New England	10	4.40	110	+0.4	.....
Middle Atlantic	12	2.68	73	-1.0	.....
South Atlantic	10	3.31	79	-0.9	.....
Florida Peninsula	7	3.26	119	+0.5	.....
East Gulf	7	2.94	56	-2.3	.....
West Gulf	7	3.42	97	-0.1	.....
Ohio Valley and Tennessee	12	2.64	62	-1.6	.....
Lower Lake	8	2.53	96	-0.1	.....
Upper Lake	9	1.29	65	-0.7	.....
North Dakota	7	0.31	38	-0.5	.....
Upper Mississippi Valley	11	1.12	65	-0.6	.....
Missouri Valley	10	0.44	42	-0.6	.....
Northern Slope	7	0.11	15	-0.6	.....
Middle Slope	6	0.24	29	-0.6	.....
Southern Slope	6	0.47	44	-0.6	.....
Southern Plateau	13	0.38	32	-0.8	.....
Middle Plateau	9	0.62	44	-0.8	.....
Northern Plateau	10	1.00	50	-1.0	.....
North Pacific	9	5.59	78	-1.6	.....
Middle Pacific	5	4.98	89	-0.6	.....
South Pacific	4	1.38	50	-1.4	.....

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 11. Louisiana, 21. Mississippi, 10.

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 1, 11, 12. Arkansas, 18, 28. California, 5. Colorado, 5. Connecticut, 10, 11, 12, 25, 28, 29. Delaware, 12. Idaho, 1, 2, 23, 24. Illinois, 13, 14, 17. Indiana, 5, 11, 12, 13, 17. Iowa, 10, 11, 15, 16, 17. Kansas, 5, 6. Kentucky, 9, 19. Maine, 1, 7, 12, 20, 21, 25, 26, 29. Maryland, 11, 12, 13, 16, 17, 21, 22, 23, 27, 28, 29, 30, 31. Massachusetts, 11, 12, 16, 21, 25, 26, 28, 29. Michigan, 9, 11, 17, 24. Minnesota, 8. Mississippi, 1, 27. Missouri, 11, 17, 18, 19. Montana, 5, 16, 19. Nebraska, 10, 15. New Hampshire, 7, 10, 11, 12, 18, 21, 25, 28. New Jersey, 11, 14, 28, 29. New Mexico, 8, 17. New York, 7, 8, 10, 11, 12, 15, 18. North Carolina, 27. North Dakota, 13. Ohio, 5, 10, 11, 12, 13, 14, 15, 25. Oklahoma, 28. Oregon, 22, 23. Pennsylvania, 10, 11, 12, 14, 17, 25. South Carolina, 27, 31. South Dakota, 3, 10, 13. Tennessee, 11, 13, 25. Texas, 25, 26, 27, 28, 29. Utah, 3, 15, 19. Vermont, 10, 14, 19, 25. Virginia, 11, 12. Washington, 2, 3, 4, 13, 14, 21, 22, 23. West Virginia, 11, 21. Wisconsin, 9, 17, 24. Wyoming, 14.

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.9	+0.1	Missouri Valley	4.7	-0.4
Middle Atlantic	5.5	-0.1	Northern Slope	4.4	-0.2
South Atlantic	4.5	-0.8	Middle Slope	3.5	0.0
Florida Peninsula	5.7	+1.0	Southern Slope	3.5	0.0
East Gulf	5.0	-0.6	Southern Plateau	2.8	0.0
West Gulf	5.6	+0.2	Middle Plateau	4.6	-0.2
Ohio Valley and Tennessee	5.9	-0.5	Northern Plateau	6.4	-0.9
Lower Lake	7.7	+0.2	North Pacific Coast	6.9	-0.2
Upper Lake	7.2	+0.4	Middle Pacific Coast	6.7	+1.6
North Dakota	4.5	-0.2	South Pacific Coast	5.5	+1.4
Upper Mississippi	5.4	+0.1			

HUMIDITY.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	76	0	Missouri Valley	74	-4
Middle Atlantic	75	0	Northern Slope	69	-1
South Atlantic	75	-3	Middle Slope	68	+1
Florida Peninsula	82	0	Southern Slope	70	+6
East Gulf	72	-6	Southern Plateau	43	-8
West Gulf	77	+2	Middle Plateau	68	-1
Ohio Valley and Tennessee	76	-1	Northern Plateau	80	-1
Lower Lake	79	+2	North Pacific Coast	87	0
Upper Lake	84	+2	Middle Pacific Coast	87	+6
North Dakota	79	-2	South Pacific Coast	79	+5
Upper Mississippi	80	+2			

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Block Island, R. I.	26	62	w.	Mount Tamalpais, Cal.	9	60	nw.
Boston, Mass.	1	50	w.	New York, N. Y.	8	58	w.
Do.	2	52	w.	Do.	21	57	nw.
Do.	11	52	e.	Do.	26	78	w.
Do.	12	50	sw.	Do.	27	59	nw.
Do.	27	51	w.	Do.	29	58	nw.
Buffalo, N. Y.	2	68	w.	Pierre, S. Dak.	24	58	nw.
Cleveland, Ohio	26	52	w.	Point Reyes Light, Cal.	2	60	sw.
Eastport, Me.	1	50	e.	Sioux City, Iowa	24	60	nw.
Do.	29	52	ne.	Woods Hole, Mass.	26	59	nw.
Helena, Mont.	23	52	w.	Do.	29	59	sw.
Mount Tamalpais, Cal..	2	64	se.				

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table VII, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and

auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 266 thunderstorms were received during the current month as against 426 in 1899 and 167 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 11th, 51; 10th, 36; 9th, 25; 24th, 21.

Reports were most numerous from: Texas, 49; Louisiana, 26; Georgia, 23.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, 11th to 19th.

The greatest number of reports were received for the following dates: 20th, 48; 21st, 7; 24th, 6.

Reports were most numerous from Minnesota, 19; Montana, 13; South Dakota, 12.

In Canada.—Auroras were reported as follows: Toronto, 20th; Minnedosa, 4th, 5th, 25th, 26th; Banff, 19th; Prince Albert, 22d; Battleford, 5th, 21st, 25th; Barkerville, 24th, 25th, 26th.

DESCRIPTION OF TABLES AND CHARTS.

By ALFRED J. HENRY, Chief of Division of Meteorological Records.

Table I gives, for about 145 Weather Bureau stations making two observations daily and for about 25 others making only one observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation, the total depth of snowfall, and the mean wet-bulb temperatures. The altitudes of the instruments above ground are also given.

Table II gives, for about 2,700 stations occupied by voluntary observers, the highest maximum and the lowest minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (....).

Table III gives, for 44 stations selected out of 144 that maintain continuous records, the mean hourly temperatures deduced from the Richard thermographs described and figured in the Report of the Chief of the Weather Bureau, 1891-92, p. 29.

Table IV gives, for 44 stations selected out of 142 that maintain continuous records, the mean hourly pressures as automatically registered by Richard barographs, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau, 1891-92, pp. 26 and 30.

Table V gives, for about 157 stations, the arithmetical means of the hourly movements of the wind ending with the respective hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891-92, p. 19.

Table VI gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total

movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division the average resultant direction for that division can be obtained.

Table VII gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table VIII gives, for about 95 stations, the average hourly sunshine (in percentages) as derived from the automatic records made by two essentially different types of instruments, designated, respectively, the thermometric recorder and the photographic recorder. The kind of instrument used at each station is indicated in the table by the letter T or P in the column following the name of the station.

Table IX gives a record of rains whose intensity at some period of the storm's continuance equaled or exceeded the following rates:

Duration, minutes..	5	10	15	20	25	30	35	40	45	50	60	80	100	120
Rates pr. hr. (ins.)..	3.00	1.80	1.40	1.20	1.08	1.00	0.94	0.90	0.86	0.84	0.75	0.60	0.54	0.50

In the northern part of the United States, especially in the colder months of the year, rains of the intensities shown in the above table seldom occur. In all cases where no storm of sufficient intensity to entitle it to a place in the full table has occurred, the greatest rainfall of any single storm has been given, also the greatest hourly fall during that storm.

Table X gives, for about 30 stations furnished by the Canadian Meteorological Service, Prof. R. F. Stupart, director, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values, except in the case of snowfall.

Table XI gives the heights of rivers referred to zeros of gages.

NOTES EXPLANATORY OF THE CHARTS.

Chart I, tracks of centers of high areas, and Chart II, tracks of centers of low areas, are constructed in the same